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IN THE CLAIMS:

1. **(Amended)** A composition comprising:

- a radionuclide, excluding I-123, I-125 and I-131, optionally as part of a compound or complex,
- a targeting agent, and
- iodide ions or a compound which releases or generates iodide ions,

where the iodide ions aid in stabilizing the composition against degradation thus maintaining high radiochemical purity of the composition, and,

where the targeting agent:

- is a peptide, oligonucleotide, antibody or peptidomimetic, or
- is a targeting agent bonded to a complexing moiety, of the following formula:

$$A—CZ(B)—[C(R^1R^2)]_n—X$$

wherein A is H, HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC or R^4; B is H, SH or —NHR^3, —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) or R^4; X is SH or —NHR^3, —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) or R^4; R^1, R^2, R^3 and R^4 are independently H or straight or branched chain or cyclic lower alkyl; n is 0, 1 or 2; and, Z is H, SH or R^4; provided that: (a) where B is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound), X is SH and n is 1 or 2; (b) where X is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound), B is SH and n is 1 or 2; (c) where B is H or R^4, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC, X is SH and n is 0 or 1; (d) where A is H or R^4, then, where B is SH, X is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) and where X is SH, B is —NHR^3 or —$N(R^3)$-(peptide,

oligonucleotide, antibody or small organic compound); (e) where X is H or R^4, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC and B is SH; (f) where Z is methyl, X is methyl, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC and B is SH and n is 0; and (g) where Z is SH and X is SH, n is not 0; and wherein the thiol moiety is in the reduced form and the complexing group is capable of being covalently linked to the peptide, oligonucleotide, antibody or small organic compound.

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7. (Amended) The composition of claim 6, wherein the targeting agent bonded to a complexing moiety is of the formula:

$$A—CZ(B)—[C(R^1R^2)]_n—X$$

wherein A is H, HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC or R^4; B is H, SH or —NHR^3, —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) or R^4; X is SH or —NHR^3, —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) or R^4; R^1, R^2, R^3 and R^4 are independently H or straight or branched chain or cyclic lower alkyl; n is 0, 1 or 2; and, Z is H, SH or R^4; provided that: (a) where B is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound), X is SH and n is 1 or 2; (b) where X is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound), B is SH and n is 1 or 2; (c) where B is H or R^4, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC, X is SH and n is 0 or 1; (d) where A is H or R^4, then, where B is SH, X is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) and where X is SH, B is —NHR^3 or

—N(R^3)-(peptide, oligonucleotide, antibody or small organic compound); (e) where X is H or R^4, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC and B is SH; (f) where Z is methyl, X is methyl, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC and B is SH and n is 0; and (g) where Z is SH and X is SH, n is not 0; and wherein the thiol moiety is in the reduced form and the complexing group is capable of being covalently linked to the peptide, oligonucleotide, antibody or small organic compound.

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11. (Amended) A method for stabilizing a composition comprising:

- a radionuclide, excluding I-123, I-125 and I-131, optionally as part of a compound or complex, and
- a targeting agent which:
  - is a peptide, oligonucleotide, antibody or peptidomimetic, or
  - is a targeting agent bonded to a complexing moiety, of the following formula:

$$A—CZ(B)—[C(R^1R^2)]_n—X$$

wherein A is H, HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC or R^4; B is H, SH or —NHR^3, —N(R^3)-(peptide, oligonucleotide, antibody or small organic compound) or R^4; X is SH or —NHR^3, —N(R^3)-(peptide, oligonucleotide, antibody or small organic compound) or R^4; R^1, R^2, R^3 and R^4 are independently H or straight or branched chain or cyclic lower alkyl; n is 0, 1 or 2; and, Z is H, SH or R^4; provided that: (a) where B is —NHR^3 or —N(R^3)-(peptide, oligonucleotide, antibody or small organic compound), X is SH and n is 1 or 2; (b) where X is —NHR^3 or —N(R^3)-(peptide, oligonucleotide, antibody or

small organic compound), B is SH and n is 1 or 2; (c) where B is H or R^4, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC, X is SH and n is 0 or 1; (d) where A is H or R^4, then, where B is SH, X is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) and where X is SH, B is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound); (e) where X is H or R^4, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC and B is SH; (f) where Z is methyl, X is methyl, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC and B is SH and n is 0; and (g) where Z is SH and X is SH, n is not 0; and wherein the thiol moiety is in the reduced form and the complexing group is capable of being covalently linked to the peptide, oligonucleotide, antibody or small organic compound,

to prevent or lessen the occurrence of the radionuclide degrading, the method comprising providing iodide ions in the composition.

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17. (Amended) The method of claim 16, wherein the targeting agent bonded to a complexing moiety is of the formula:

$$A—CZ(B)—[C(R^1R^2)]_n—X$$

wherein A is H, HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC or R^4; B is H, SH or —NHR^3, —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) or R^4; X is SH or —NHR^3, —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) or R^4; R^1, R^2, R^3 and R^4 are independently H or straight or branched chain or cyclic lower alkyl; n is 0, 1 or 2; and, Z is H, SH or R^4; provided that: (a) where B is

—NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound), X is SH and n is 1 or 2; (b) where X is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound), B is SH and n is 1 or 2; (c) where B is H or R^4, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC, X is SH and n is 0 or 1; (d) where A is H or R^4, then, where B is SH, X is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) and where X is SH, B is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound); (e) where X is H or R^4, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC and B is SH; (f) where Z is methyl, X is methyl, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC and B is SH and n is 0; and (g) where Z is SH and X is SH, n is not 0; and wherein the thiol moiety is in the reduced form and the complexing group is capable of being covalently linked to the peptide, oligonucleotide, antibody or small organic compound.

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23. (Amended) A kit comprising:

(a) a targeting agent capable of being associated with a radionuclide, which:

- is a peptide, oligonucleotide, antibody or peptidomimetic, or
- is a targeting agent bonded to a complexing moiety of the following formula:

$$A—CZ(B)—[C(R^1R^2)]_n—X$$

wherein A is H, HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC or R^4; B is H, SH or —NHR^3, —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic

compound) or R^4; X is SH or —NHR^3, —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) or R^4; R^1, R^2, R^3 and R^4 are independently H or straight or branched chain or cyclic lower alkyl; n is 0, 1 or 2; and, Z is H, SH or R^4; provided that: (a) where B is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound), X is SH and n is 1 or 2; (b) where X is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound), B is SH and n is 1 or 2; (c) where B is H or R^4, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC, X is SH and n is 0 or 1; (d) where A is H or R^4, then, where B is SH, X is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) and where X is SH, B is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound); (e) where X is H or R^4, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC and B is SH; (f) where Z is methyl, X is methyl, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC and B is SH and n is 0; and (g) where Z is SH and X is SH, n is not 0; and wherein the thiol moiety is in the reduced form and the complexing group is capable of being covalently linked to the peptide, oligonucleotide, antibody or small organic compound,

(b) iodide ions or a compound which releases or generates iodide ions, which iodide ions prevent or lessen degradation of the radionuclide due to radiolysis or free ions, and

(c) components for generating a radionuclide, excluding I-123, I-125 and I-131, capable of being associated with the targeting agent,

wherein the kit has two or three compartments, (c) is contained in a separate compartment from (a) or (b) and (a) and (b) may be in the same or different compartments.

28. (Amended) The kit of claim 27, wherein the targeting agent bonded to a complexing moiety is of the formula:

$$A—CZ(B)—[C(R^1R^2)]_n—X$$

wherein A is H, HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC or R^4; B is H, SH or —NHR^3, —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) or R^4; X is SH or —NHR^3, —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) or R^4; R^1, R^2, R^3 and R^4 are independently H or straight or branched chain or cyclic lower alkyl; n is 0, 1 or 2; and, Z is H, SH or R^4; provided that: (a) where B is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound), X is SH and n is 1 or 2; (b) where X is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound), B is SH and n is 1 or 2; (c) where B is H or R^4, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC, X is SH and n is 0 or 1; (d) where A is H or R^4, then, where B is SH, X is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound) and where X is SH, B is —NHR^3 or —$N(R^3)$-(peptide, oligonucleotide, antibody or small organic compound); (e) where X is H or R^4, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC and B is SH; (f) where Z is methyl, X is methyl, A is HOOC, H_2NOC, (peptide, oligonucleotide, antibody or small organic compound)-NHOC, (peptide, oligonucleotide, antibody or small organic compound)-OOC and B is SH and n is 0; and (g) where Z is SH and X is SH, n is not 0; and wherein the thiol moiety is in the reduced form and the complexing group is capable of being covalently linked to the peptide, oligonucleotide, antibody or small organic compound.

Add the following new claims:

--**32.** A composition comprising:

- a Tc-99m radionuclide, optionally as part of a compound or complex,
- a depreotide or P2045 targeting agent, and
- iodide ions or a compound which releases or generates iodide ions,

where the iodide ions aid in stabilizing the composition against degradation thus maintaining high radiochemical purity of the composition.

33. The composition of claim 1, wherein the radionuclide is Tc-99m, Re-188, Re-186, Ga-67, In-111, Yb-169, H-3, C-14, N-15, F-18, P-32, P-33 or Y-90.

34. The method of claim 11, wherein the radionuclide is Tc-99m, Re-188, Re-186, Ga-67, In-111, Yb-169, H-3, C-14, N-15, F-18, P-32, P-33 or Y-90.

35. The kit of claim 23, wherein the radionuclide is Tc-99m, Re-188, Re-186, Ga-67, In-111, Yb-169, H-3, C-14, N-15, F-18, P-32, P-33 or Y-90.--